ANOPSILANA BARNARDI, A NEW SPECIES OF ESTUARINE CIROLANID CRUSTACEAN ISOPOD FROM TROPICAL EASTERN AUSTRALIA

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Anopsilana barnardi sp.nov., the third species of *Anopsilana* recorded from Australia, is described from northeastern Queensland. A key to the Australian species is given and a list of all *Anopsilana* species is provided.☐ *Isopoda, Cirolanidae, new species, northeastern Queensland, Southwest Pacific, taxonomy.*

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Anopsilana Paulian & Deboutteville, 1956, contains thirteen species. Its occurrence is restricted to the tropical regions of the world; about half the species are recorded from troglobitic habits (both freshwater and euryhaline), the others are all recorded from mangrove or estuarine habitats.

Anopsilana barnardi sp.nov. was taken from a mid-stream grab sample in the Murray River, and it is therefore not directly associated with mangroves as are the other Australian species of *Anopsilana*.

Anopsilana Paulian & Deboutteville

Anopsilana Paulian & Deboutteville, 1956: 87. Bruce, 1981: 955, fig. 5i-e; 1986: 196; Kensley & Schotte, 1989: 124; Brusca, Wetzer & France (in press).

Troglocirolana Rioja, 1956: 447 [Type species: *Cirolana cubensis* Hay, 1903, by monotypy].

Haitilana Notenboom, 1981: 314 [Type species: *Haitilana radicicola* Notenboom, 1981, original designation].

Type Species

Anopsilana poissoni Paulian & Deboutteville, 1956, original designation. The location of the types was not given in the original publication, but was cited as at the Institute Scientific de Madagascar, Tsimbazaza, Antananarivo, Madagascar by Brusca et al. (in press).

Diagnosis

Fronal lamina usually elongate (in two Pacific species as long as wide), anterior margin projecting or sessile; pentagonal or with anterior margin rounded or truncate. Antennule with peduncular articles 1 and 2 usually coalesced. Pereopods all ambulatory. Pleopod 2 of male with appendix masculina basally or sub-basally inserted, usually robust; endopods of pleopods 3-5 without plumose marginal setae, smaller than exopod; lamellar or thickened (*A. barnardi*, *A. oaxaca*). Mouthparts and other characters as for *Cirolana*.

Remarks

Anopsilana, with little question, constitutes a polyphyletic assemblage of species, differing from *Cirolana* primarily in the lack of marginal setae on the endopods of pleopods 3 and 4. These endopods are also reduced in size in comparison to those of *Cirolana* and in at least two species are thickened or fleshy. Other minor differences, none of which are shown by all of the species placed in the genus, are the fusion of peduncular articles 1 and 2 of the antennule; article 3 of the antennule peduncle being proportionally longer than in *Cirolana* and the appendix masculina varying from being relatively robust to slender and basally inserted.

Estuarine species tend to be well pigmented and have robust well-spined pereopods that are generally similar to those of the *Cirolana* '*parva* group' or 'tuberculate group' of species. Troglobitic species have relatively more slender pereopods with, by comparison, reduced spination. Additionally all the troglobitic species lack eyes.

The distribution of the genus is restricted to tropical localities. The cavernicolous species are from the peri-Caribbean region except for one species from Madagascar and one from Palau. The open-water species are all estuarine, tropical and all have been recorded from mangroves or in the vicinity of mangroves, with the exception of the poorly known *Anopsilana luciae*. *Anopsilana pustulosa* and *A. willeyi* have extensive Indo-Pacific distributions. Brusca et al. (in press) report that *A. browni* is widely distributed in the Caribb-

can and also in the tropical East Pacific in suitable habitats.

KEY TO AUSTRALIAN SPECIES OF *ANOPSILANA*

1. Body with nodules on dorsal surfaces of pereon, pleon and pleotelson; pleotelson apex narrowly rounded; endopods of pleopods 3-5 lamellar.....2

   Body without dorsal ornamentation; pleotelson apex wide, subtruncate; endopods of pleopods 3-5 fleshy.....*A. barnardi* sp.nov.

2. Frontal lamina anterior margin rounded; pleotelson abruptly narrowed; uropod rami with dense mass of marginal setae.....*A. pustulosa*

   Frontal lamina pentagonal; lateral margins of pleotelson not abruptly narrowed; uropod rami with single rank of marginal setae.....*A. willeyi*

Anopsilana barnardi sp.nov.

MATERIAL EXAMINED

HOLOTYPE: ♂ (5.4mm), Murray R., north Queensland, 18°16'S, 146°01'E, 24 May 1978, salinity of 23-34‰, depth 1.5m, mid-estuary, mud bottom, coll. P. Davie (QM W17263).

PARATYPES: 13♂♂ (2.9-5.7mm, m = 3.9m, 5.7mm specimen dissected), 14♀♀(3.0-5.9mm non-ovig, m=4.0mm; 6.4mm ovig), manca (2.7mm), same data as holotype (QM W17264).

DESCRIPTION

Male: Body about 2.8 times as long as greatest width; dorsal surfaces without nodules, unornamented. Cephalon with median rostral point visible in dorsal view; dorsal interocular furrow present; eyes together about 0.3 width of cephalon. Pereonite 1 about 1.6 times as long as pereonite 2; pereonite 2>3>4<5 = 6>7 in length; pereonite 7 shortest. Coxae of pereonites 2-7 each with distinct and entire oblique carina; coxae 4-7 with posteroventral angle becoming increasingly acute. Pleonite 1 concealed by pereonite 7; pleonite 3 with lateral margins posteriorly produced and overlapping lateral margins of pleonite 4 which are produced posteriorly beyond pleonite 5. Pleotelson 0.65 as long as anterior width; lateral margins convex, posterior margin subtruncate, provided with 8 (or 9, see Variation) spines, interspersed with 2 short setae between each spine pair.

Antennule peduncle articles 1 and 2 fused, article 3 about 1.2 times as long as fused articles 1 and 2; flagellum extending to middle of pereonite 1, with 8 articles, the distal 2 being minute, about 0.7 as long as peduncle. Antennal peduncle article 4 about 2.5 times as long as article 3; peduncular article 5 about 1.2 times as long as 4; flagellum extending to pereonite 4, composed of about 17 articles. Frontal lamina pentagonal, sessile; lateral margins diverging anteriorly. Mandible lacking lacinia mobilis; spine row with 9 spines; molar process very thin, with 13 or 14 teeth; palp article 2 with 12 serrate setae on distolateral margin, article 3 with 14 setae distal 3 of which are longer than remaining 11 and feebly serrate, others obviously serrate. Maxillule with 12 spines on gnathal surface of lateral lobe; medial lobe with 3 stout moderately plumose spines. Maxilla with 5 long setae on lateral lobe, 9 long setae on central lobe, medial lobe with 4 stout plumose setae proximally, distally 6 simple setae. Maxilliped with simple setae only; endite with 2 coupling hooks and 4 plumose setae.

Pereopod 1 basis with 1 long and 1 short seta at posterodistal angle; ischium with 2 setae at anterodistal angle, 2 small setae at posterodistal lateral margin and 1 spine at posterodistal medial margin; merus with 4 short stout tubercular spines on lateral posterior margin and 5th longer spine at posterodistal angle, posterior medial margin with 2 acute spines; carpus with single acute spine and 3 setae at posterodistal angle; propodus palm with 2 acute spines and third stout spine and 2 setae opposing dactylus. Pereopods 2 and 3 similar to 1 but less robust. Pereopod 2 ischium with 2 acute spines at anterodistal angle and 2 stout spines at posterodistal angle; merus with 2 large and 2 small spines at anterodistal angle, posterodistal margin with 6 blunt spines in 2 clusters; carpus with 3 spines at posterodistal angle; propodus with single spine on palm. Pereopods 4-7 essentially similar, becoming longer posteriorly. Pereopod 7 ischium with group of 5 spines at anterodistal angle, posterior margin with 3 groups of spines; merus with clusters of 6 and 4 spines at distal angles, 3 spines set posteromedially; carpus with abundant spines on distal margin (about 13), 1 and 2 spines set on posterior margin; propodus with 2 pairs of spines on posterior margin; some spines on anterior margins strongly pectinate; spines on posterior margin all simple. Penes small, inconspicuous (only easily visible on dissected male paratype) papillae, set submedially on posterior of sternite 7.

Pleopod 1 rami subequal length, endopod slight-

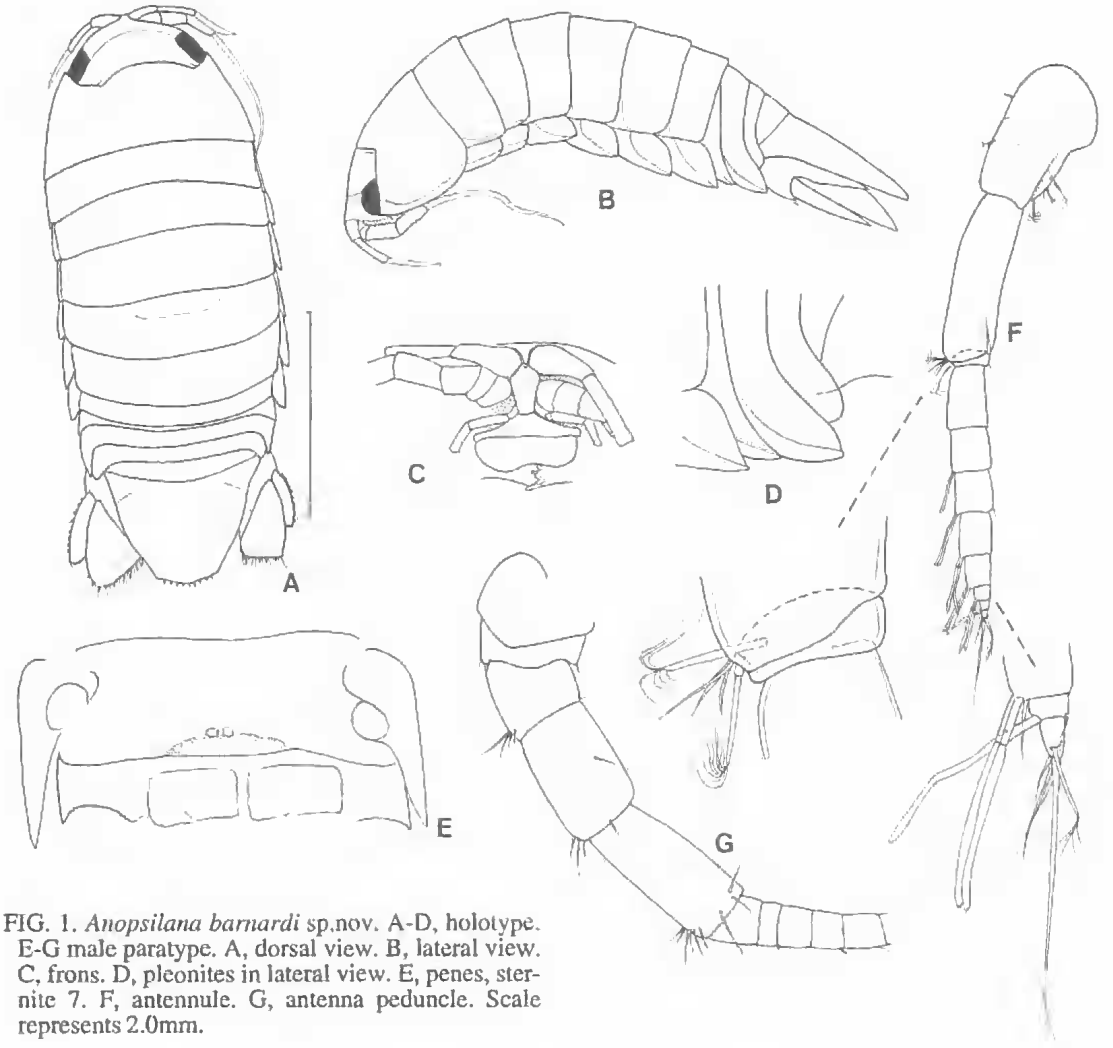

FIG. 1. *Anopsilana barnardi* sp.nov. A-D, holotype. E-G male paratype. A, dorsal view. B, lateral view. C, frons. D, pleonites in lateral view. E, penes, sternite 7. F, antennule. G, antenna peduncle. Scale represents 2.0mm.

ly less than half as wide (0.45) as exopod; peduncle about 1.8 as wide as long, medial margin with 4 coupling hooks. Pleopod 2 with rami subequal in length; appendix masculina broad, 0.3 as wide as endopod, arising basally and extending just beyond end of endopod. Pleopods 3-5 exopod with complete but faint suture; endopods fleshy and small, about 0.5 as wide and 0.7 as long as exopods. Uropod rami not extending beyond posterior of pleotelson, exopod 0.85 as long as endopod; exopod lateral margin with 9 spines, medial margin with 6; endopod lateral margin with 3 spines, medial with 7; peduncle with 2 spines at lateroventral angle; apices of both rami weakly bifid; both rami with plumose marginal setae among spines except for proximal three quarters of lateral margin of endopod.

Female: Slightly larger than male, differs in secondary sexual characters. Brood pouch made up of overlapping oostegites arising from sternites 1-5; embryos within dorsally oriented infolding of sternites.

Colour: Pale brown in alcohol, dorsal surfaces with brown chromatophores; eyes black.

Size: Males average at 3.9mm, non-ovigerous females at 4.0mm.

Variation: There is considerable variation in the number of spines present on the pleotelson and uropodal rami. The commonest spine counts are: pleotelson with 8 spines (47.6%) or 9 spines (33.3%), occasionally 7 or 10; exopod lateral margin with 7-10 spines, 9 spines (50.0%) or 8 spines (35.7%) commonest; exopod medial margin with 5 (71.4%) or 6 (19.0%) spines; endopod lateral

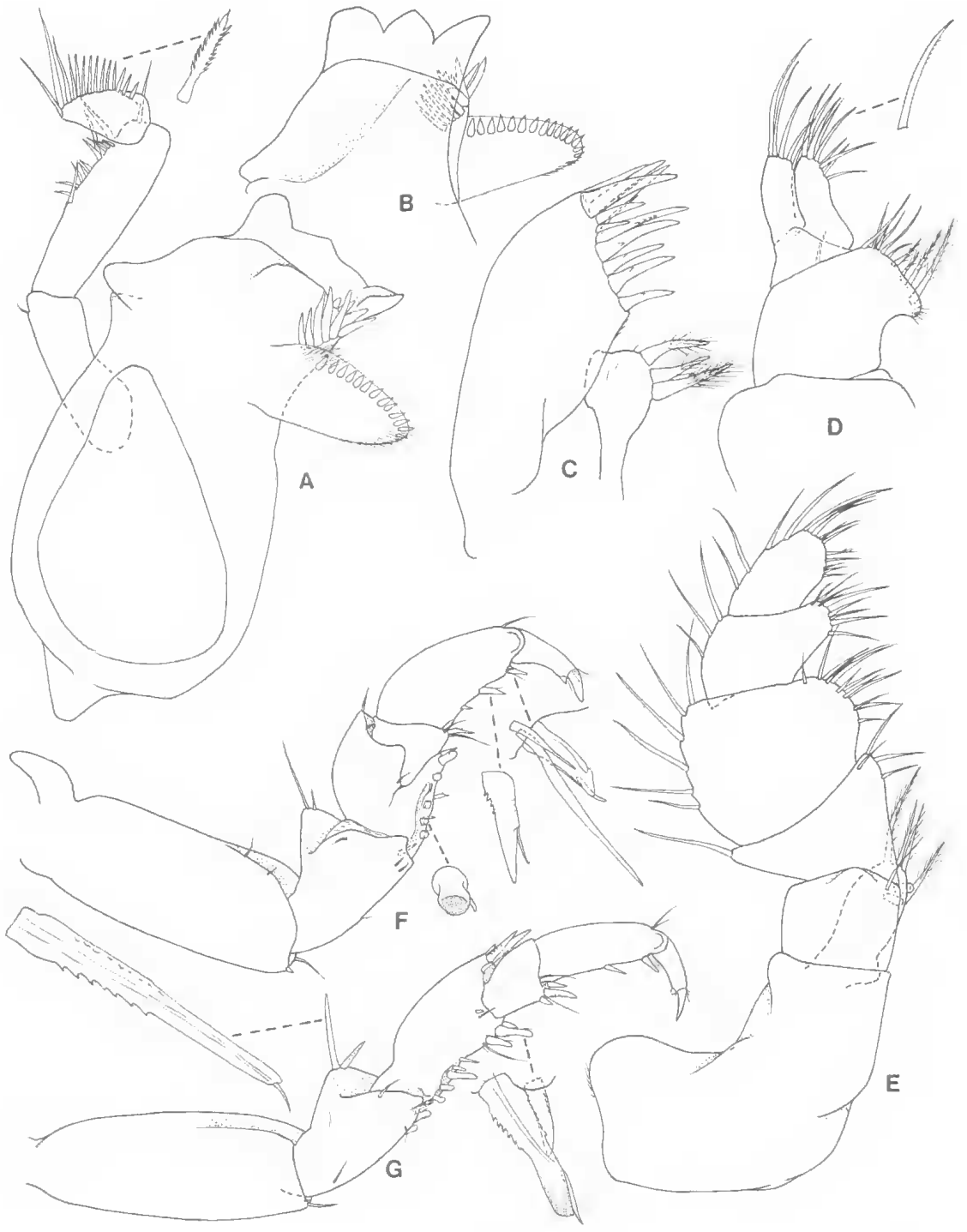

FIG. 2. *Anopsilana barnardi* sp.nov., male paratype. A, left mandible. B, right mandible, incisor. C, maxillule. D, maxilla. E, maxilliped. F, pereopod 1. G, pereopod 2.

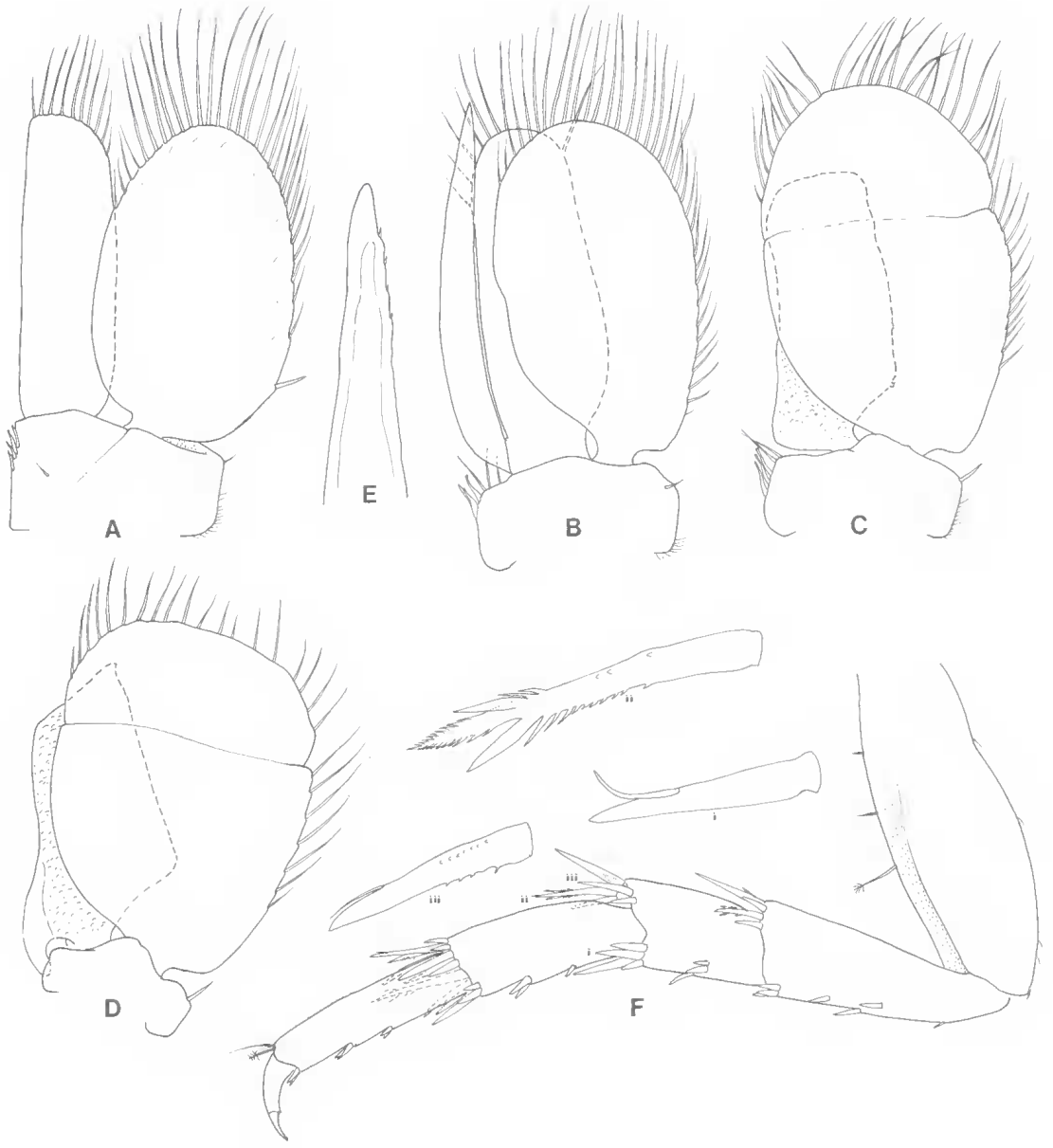

FIG. 3. *Anopsilana barnardi* sp.nov., male paratype. A-D, pleopods 1-3, 5 respcctively. E, apendix masculina apex. F, pereopod 7.

margin with 3 (60%) or 4 (40%) spines, medial margin with 5 (15.0%), 6 (57.5%) or 7 (27.5%) spines (the holotype, 10 males and 10 females were examined for spine counts).

REMARKS

This species is easily separated from the two other Australian species by the lack of nodules or other cuticular ornamentation. The pleopods of *Anopsilana barnardi* have the endopod of pleopods 3-5 far smaller than those of *A. pustulosa* Hale (see Bruce 1981, fig. 5i-l) or *A. willeyi* Stebbing (see Bruce 1986, fig 138), and furthermore the endopod is thickened and semi-opaque,

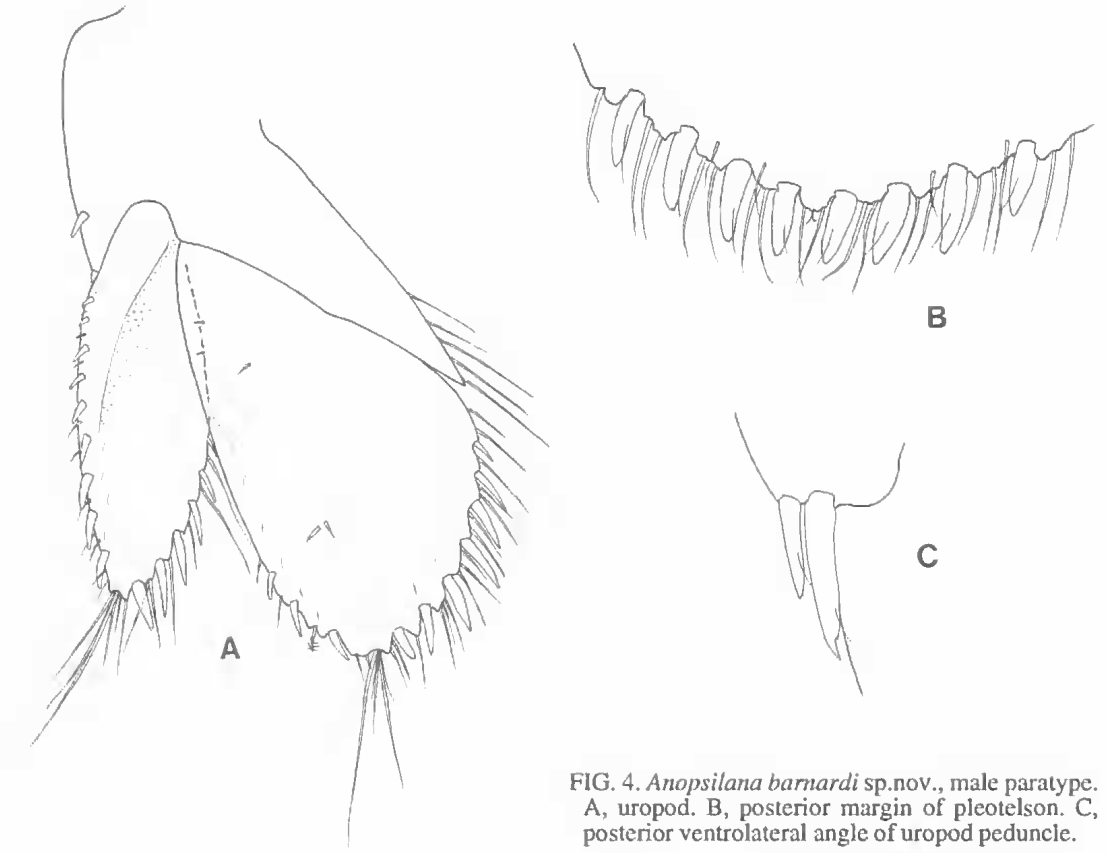

FIG. 4. *Anopsilana barnardi* sp.nov., male paratype. A, uropod. B, posterior margin of pleotelson. C, posterior ventrolateral angle of uropod peduncle.

not lamellar. There are only two other Indo-Pacific species of *Anopsilana*: *A. lingua* Bowman & Iliffe, 1987, which is a blind freshwater cave dwelling species from Palau, and *A. luciae* (Barnard, 1940) a poorly described estuarine species from South Africa. *Anopsilana luciae* differs by having a rounded projecting frontal lamina, a narrow pleotelson apex and two longitudinal submedian carinae on the pleotelson. It is possible that some estuarine species currently placed in *Cirolana* may prove to belong to *Anopsilana* when the pleopods have been examined.

ETYMOLOGY

The species is named to honour the late Dr J.L. Barnard who has made an immense contribution to the knowledge of Australian peracarid Crustacea.

SYNOPSIS OF *ANOPSILANA* SPECIES

Anopsilana acanthura (Notenboom, 1981)

DISTRIBUTION: Known only from a well in Haiti.

TYPES: Zoölogisch Museum, Amsterdam.

Anopsilana browni (Van Name, 1936)

DISTRIBUTION: Brackish and freshwater; Caribbean; Cuba and Belize; East Pacific: Costa Rica (Kensley & Schotte, 1989).

TYPES: American Museum of Natural History, New York.

Anopsilana crenata Bowman & Franz, 1982

DISTRIBUTION: Freshwater pool in a cave, Grand Cayman Island.

TYPES: Smithsonian Institution.

Anopsilana cubensis (Hay, 1903)

DISTRIBUTION: Caves in several localities in Cuba.

TYPES: Smithsonian Institution.

Anopsilana jonesi Kensley, 1987

DISTRIBUTION: Amongst mangroves, Belize.

TYPES: Smithsonian Institution.

Anopsilana lingua Bowman & Iliffe, 1987

DISTRIBUTION: Natural well on Peleliu Island, Palau.

TYPES: Smithsonian Institution.

Anopsilana luciae (Barnard, 1940)

DISTRIBUTION: Estuarine, South Africa.

TYPES: South African Museum, Cape Town.

Anopsilana oaxaca Carvacho & Haasmann, 1984

DISTRIBUTION: Mangroves roots, Pacific coast of Mexico; also Clipperton Island (Brusca et al. in press).

TYPES: Institute of Biology, National Autonomous University of Mexico.

Anopsilana poissoni Paulian & Deboutteville, 1956

DISTRIBUTION: Mitoho Cave, southern Madagascar.

TYPES: Not stated, but see type species entry after genus synonymy given here.

Anopsilana pustulosa (Hale, 1925)

DISTRIBUTION: Estuarine and mangrove habitats from East Africa to Australia; generally within the tropics (Bruce, 1986). Type locality: Cooktown, Queensland.

TYPES: Australian Museum, Sydney.

Anopsilana radicicola (Notenboom, 1981)

DISTRIBUTION: Natural spring, Haiti.

TYPES: Zoölogisch Museum, Amsterdam.

Anopsilana willeyi (Stebbing, 1904)

DISTRIBUTION: Estuarine and mangrove habitats from East Africa to Australia, within the tropics (Bruce, 1986). Type locality: Sri Lanka (Stebbing, 1904, as Ceylon).

TYPES: Not located.

LITERATURE CITED

BARNARD, K.H. 1940. Contributions to the crustacean fauna of South Africa 12. Further additions to the Tanaidacea, Isopoda and Amphipoda, together with keys for the identification of hitherto recorded marine and freshwater species. Annals of the South African Museum 32: 381-515.

BOWMAN, T.E. & FRANZ, R. 1982. *Anopsilana crenata*, a new troglobitic cirolanid isopod from Grand Cayman Island, Caribbean Sea. Proceedings of the Biological Society of Washington 95: 522-529.

BOWMAN, T.E. & ILIFFE, T.M. 1987. *Anopsilana lingua*, a new freshwater troglobitic isopod from the Palau Islands (Flabellifera: Cirolanidae). Proceedings of the Biological Society of Washington 100: 347-352.

BRUCE, N.L. 1981. Cirolanidae (Crustacea: Isopoda) of Australia: Diagnoses of *Cirolana* Leach, *Metacirolana* Nierstrasz, *Neocirolana* Hale, *Anopsilana* Paulian and Deboutteville, and three new genera - *Natatolana*, *Politolana* and *Carpetolana*. Australian Journal of Marine and Freshwater Research 32: 945-966.

1986. Cirolanidae (Crustacea: Isopoda) of Australia. Records of the Australian Museum, Supplement 6: 1-239.

BRUSCA, R.C., WETZER, R. & FRANCE, S.C. (in press). A monograph on the cirolanid isopods (Crustacea: Isopoda: Flabellifera: Cirolanidae) of the tropical eastern Pacific.

CARVACHO, A. & HAASMANN, Y. 1984. Isopodos litorales de Oaxaca, Pacifico Mexico. Cahiers de Biologie Marine 25: 15-32.

HALE, H.M. 1925. Review of Australian isopods of the cymothoid group. Pt 1. Transactions of the Royal Society of South Australia 49: 128-185.

HAY, W.P. 1903. On a small collection of crustaceans from the island of Cuba. Proceedings of the United States National Museum 26: 429-435.

KENSLEY, B. 1987. Further records of marine isopod crustaceans from the Caribbean. Proceedings of the Biological Society of Washington 100: 559-577.

KENSLEY, B. & SCHOTTE, M. 1989. 'Guide to the Marine Isopod Crustaceans of the Caribbean.' (Smithsonian Institution Press: Washington, D.C.). 308pp.

NOTENBOOM, J. 1981. Some new hypogean cirolanid

isopod crustaceans from Haiti and Mayaguana (Bahamas). Bijdragen tot de Dierkunde 51: 313-331.

PAULIAN, R. & DEBOUTTEVILLE, C.D. 1956. Un cirolanide cavernicole a Madagascar [Isopode]. Mémoires de l'Institute Scientifique de Madagascar. Série A, 11: 85-88.

RIOJA, E. 1956. Estudios carcinologicos 35. Datos Sobre algunos isopodos cavernicolas de la isla de Cuba. Anales del Instituto de Biologia, Universidad de México 27: 437-462.

STEBBING, T.R.R. 1904. Gregarious Crustacea of Ceylon. Spolia Zeylanica, Bulletin of the National Museum, Ceylon 2: 1- 26.

VAN NAME, W.G. 1936. The American land and freshwater isopod Crustacea. Bulletin of the American Museum of Natural History 71: i-vii, 1-535.